ATTACHMENT 5

RIPARIAN DEMONSTRATION

Attachment 5: Riparian Improvement Demonstration

The stream in an 80 acre pasture (Figure 1) is becoming incised, in part due to concentrated runoff flow entering the pasture at a road culvert on the west and from another culvert as it leaves on the North.

Range condition in the lowland riparian area was declining. Riparian grasses and sedges were being out-competed by invading hedge trees. Compounding the problem, increased shade desirable to livestock in this area was increasing the grazing pressure on what forage remained.

The number of hedge trees in both the lowland and upland potions of the pasture was increasing. A spring in the pasture was drying up and associated cottonwood trees were beginning to die.

Beginning at the upstream portion of the stream, channel incision and hedge encroachment is first evident below the culvert where the stream enters the west side of the pasture (Figure 2).

The current riparian area begins at a spring located near the cottonwood on the right (Figure 3). In the past another down-stream spring supported stream flow and riparian conditions. Dying cottonwoods on the left mark the location of the former spring. Hedge trees such as those in the foreground were out competing species needed for riparian functioning such as willows, cottonwoods, native grasses and sedges.

Upland hedge trees are ineffective in stabilizing stream banks and preventing a stream from first widening and then becoming more incised. Notice in Figure 4 how the orange roots of the hedge tree on the right extend laterally toward the stream, and how the channel has widened due to streambank erosion. The rooting structure of riparian species that established at the waters edge have better streambank stabilizing properties. Notice how roots of the sapling on the left are growing back into the stream bank and helping to prevent erosion and stream channel widening.

Farther down stream cottonwoods are dying (likely due to hydrologic changes) and being replaced by hedge trees that provide shade which is more desirable to

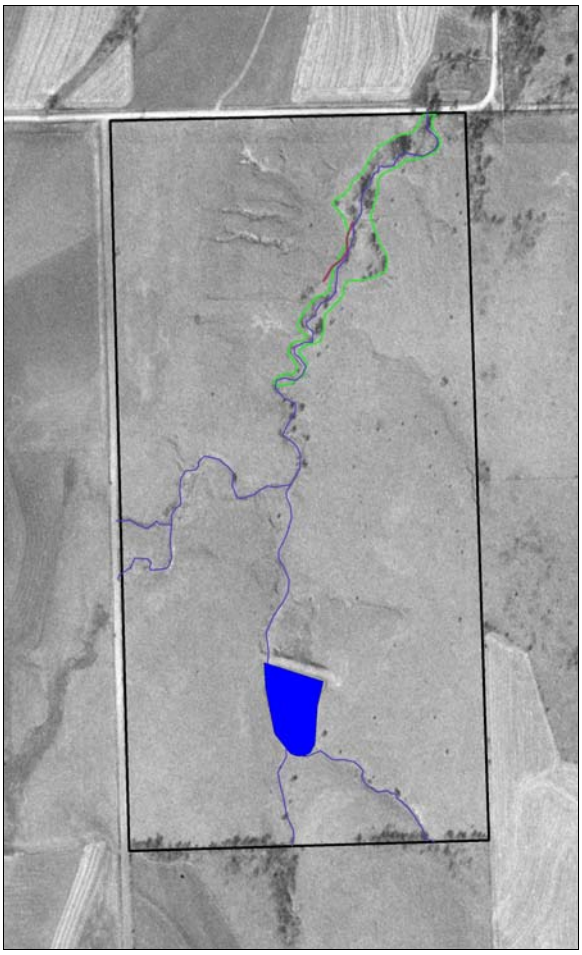

Figure 1 Aerial photo of 80 acre pasture with riparian area outlined in green and an example of trailing is shown in red.

Figure 2. Stream channel entering pasture from the west, immediately below road culvert.

livestock. The hedge trees are competing with grasses in the riparian community for light, water and nutrients. Range condition in the riparian area is declining from this and increased livestock use because of shade availability. Over grazing, trampling of vegetation, and trailing are contributing to water quality concerns in the riparian area (Figure 5). As livestock trail to the pond for water, stream side soil is exposed to the erosive affects of runoff and high stream flow events (Figure 6).

Figure 3. The remaining riparian area is at the south end of the pasture. (View looking north)

An attempt by the cooperator to control upland hedge trees using spot-treatments of foliar applied herbicide had less than optimal results. Neither of the two trees shown in the foreground of Figure 7 were completely killed following spraying. Notice the area of green remaining on the treated trees.

The cooperator was introduced to woody species control technique called basal bark treatment (Figure 8). Basal bark control involves applying herbicide directly (targeted) to the trunk of the tree. From a management perspective, this treatment method is highly recommended over broadcast spraying except where dense stands of undesirable species exist on prohibitive terrain. However, from a water quality/environmental perspective, basal bark, frill & girdle, and spot treatments are always preferred relative to broadcast (aerial or ground) treatments. This is because broadcast treatments: impact non-target species, rely on one treatment method (chemical) instead of integrating (chemical, biological and/or cultural) controls, fail to account for changes in invasive densities, and usually result in the application of more control (especially chemical) than is necessary.

Plant regrowth following basal bark treatment of hedge trees was considerable despite drought conditions (Figure 9). Controlling the hedge trees reduced the shade canopy which reduced livestock use of the area and exposed remaining grasses to increased sun light. Controlling the hedge trees also reduced the competition for nutrients and soil moisture. Continued control of hedge trees in lowland range site/riparian area will promote plant succession returning to a riparian community where hydrologic conditions are suitable. Note the abundant false indigo bush in the flood plain shown at the right of Figure 10.

Figure 4. Rooting structures and streambank erosion.

Figure 5. Dying cottonwood trees and declining riparian condition.

Figure 6. Eroding stream bank and livestock trail

Figure 7. An early attempt by the cooperator to control hedge trees using foliar herbicide.

Figure 8. Basal bark technique for controlling invasive woody species.

Figure 9. Control of hedge trees has improved cover due to reduced shade.

Figure 10. Desirable species are increasing in lowland and riparian sites.